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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,504	03/01/2004	Dar-Ming Chiang	250913-1140	2741
24504 7590 05/29/2008 THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP 600 GALLERIA PARKWAY, S.E. STE 1500 ATLANTA, GA 30339-5994				
EXAMINER				
DESAL, ANISH P				
ART UNIT		PAPER NUMBER		
1794				
MAIL DATE		DELIVERY MODE		
05/29/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/791,504

**Applicant(s)**

CHIANG ET AL.

**Examiner**

ANISH DESAI

**Art Unit**

1794

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02/24/08.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 39-44 and 46-53 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 39-44 and 46-53 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Inventor's Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. Applicant's arguments in response to the Office action dated 01/08/08 have been fully considered and they are found persuasive.
2. Claims 1-38 and 45 are cancelled. Claims 39-44 and 46-53 are pending.
3. The 35 USC Section 103(a) rejections based on Yamamoto et al. (US 4,560,737) in view of Chou et al. (US 2003/0054716A1) and further in view of Asahina et al. (US 3,607,754) are withdrawn because none of the references discloses the third monomer that is copolymerized with first and second monomers as claimed. Additionally, the Examiner had improperly relied on Asahina reference to show that Asahina reference discloses vinylidene fluoride and methyl methacrylate (third monomer) are **copolymerized**. Asahina reference does not teach or suggest **copolymerization** of vinylidene fluoride and methyl methacrylate. However, upon further consideration a new 35 USC Section 103(a) rejection based on Yamamoto et al. (US 4,560,737) in view of Chou et al. (US 2003/0054716A1), and further in view of Miyazaki et al. (US 4,931,505) is made.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 39-44, 46, 47, and 50-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (US 4,560,737) in view of Chou et al. (US 2003/0054716A1) and Miyazaki et al. (US 4,560,737).

5. With respect to claim 39, the recitation "an electret coated along the porous profile" is interpreted as any reference disclosing electret coating composition as claimed that is applied to a porous substrate will read on "electret coated along the porous profile". Claims 42-44, 46, and 49 recite "or less", thus it is the examiner's position that said recitation also includes zero as the lower limit, therefore any reference that does not disclose the amount of HFP (claim 42), CTFE (claim 43), TFE (claim 44), third monomer (claim 46), and second polymer (claim 49) will also read on the said claims.

6. Yamamoto teaches a piezoelectric polymeric material in the form of a sheet or film, which comprises polymers of vinylidene fluoride (VDF) as a principle component. The piezoelectric sheet or film of Yamamoto is formed into an electret (abstract). Further, the piezoelectric polymeric sheet or film of Yamamoto comprises copolymers of VDF and chlorotrifluoroethylene (CTFE) (column 2, lines 20-21), which reads on an electret having a first polymer copolymerizing from monomers having VdF as a first monomer and HFP, CTFE, TFE, or combinations thereof as a second monomer as claimed in claim 39. Further Yamamoto teaches a spreading (coating) of a solution of copolymer (A) and vinylidene fluoride base resin on the substrate at column 4, lines 21-22.

7. Yamamoto is silent as to teaching of a porous substrate, an electret is coated on the porous substrate along the profile thereof, and a third monomer comprising cylcohexyl vinyl ether...methyl methacryate...or combinations thereof as claimed. However, Chou teaches a method of making an electret that includes coating a porous substrate (abstract). Further Chou discloses a substrate formed of nonwoven fibrous web, which includes fibers selected from polyolefin, polystyrene etc. (0021). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the nonwoven porous substrate of Chou in the invention of Yamamoto as a porous substrate because Chou provides necessary details to practice the invention of Yamamoto.

8. Yamamoto as modified by Chou is silent as to teaching third monomer comprising cylcohexyl vinyl ether...methyl methacryate...or combinations thereof as claimed. However, Mizayaki discloses a coating composition comprising a fluorine-containing copolymer (A) and a fluorine-containing copolymer of polyfluorocarbon chain-containing monomer with a hydrophilic group-containing monomer (abstract). According to Mizayaki "In the present invention, the fluorine-containing copolymer (A)...may be a copolymer of a fluoroolefin with a monomer copolymerizable therewith. As the fluorine-containing copolymer (A), it is preferred to employ...view point of coating efficiency. It is preferred to employ a copolymer of a fluoroolefin having 2 to 3 carbon atoms such as tetrafluoroethylene...vinylidene fluoride...with at least one monomer selected from the group consisting of vinyl ethers, vinyl esters...and methacrylic acid esters." (column 1 lines 45-60). Additionally, the disclosure of Mizayaki at column 2

lines 5-15 is interpreted as Mizayaki copolymerizes monomers such as alkyl vinyl ethers wherein alkyl group have 1 to 10 carbons (i.e. thus reading on butyl vinyl ether) with the fluorine-containing copolymer (A) such as vinylidene fluoride from the view point of solubility of copolymer (A) in a solvent. It is noted that Applicant's specification at page 5 lines 7-16 discloses "At most 30 mole% of organic monomers, such as cyclohexyl vinyl ether...butyl vinyl ether...or combinations thereof, can be added to the polymer comprising compounds other than perfluorinated polymer of the present invention in order to further enhance the solubility".

9. It is noted that the coating composition containing a copolymer of vinylidene fluoride and chlorotrifluoroethylene (CTFE) (column 2, lines 20-21) of Yamamoto is dissolved in a solvent before spreading it on a substrate (column 4 lines 21-22). Thus, it would have been obvious to copolymerize monomers such as alkyl vinyl ethers (e.g. butyl vinyl ether) as taught by Mizayaki with the copolymer of vinylidene fluoride and chlorotrifluoroethylene (CTFE), motivated by the desire to easily dissolve the copolymer of vinylidene fluoride and chlorotrifluoroethylene (CTFE) in a solvent.

10. With respect to claims 41 and 43, Example 1 of Yamamoto discloses 250 g of VDF monomer and 151 g of CTFE monomer that is subjected to polymerization. The chemical formulas of VDF and CTFE are  $C_2H_2F_2$  and  $CF_2=CFCl$  respectively. The molecular weight of VDF and CTFE are 64 g/mol and 116.47 g/mol respectively. Thus, the mole% of VDF in the mixture of VDF and CTFE is about 75 mole% and the mole% of CTFE in the mixture is about 25 mole%, which meets the claim limitations of claims 41 and 43 respectively. Regarding claims 42 and 44, Yamamoto is silent as to teaching

of the content of HFP and TFE, which meets the claim limitation of claims 42 and 44. As to the content of the third monomer in the first polymer of approximately 30 mole% or less as claimed in claim 46, choosing a right concentration of the third monomer involves routine skill in the art, motivated by the desire to form a first polymer that is polymerized from first, second, and third monomers.

11. Regarding claim 47, although Yamamoto does not explicitly teach the content of fluorine element in the first polymer is between 60 and 78 wt%, it is the Examiner's position that as applied to claim 39, the teachings of Yamamoto as modified by Chou and Miyazaki either explicitly or implicitly teaches the content of the fluorine element in the first polymer to be between 60 and 76 wt%. Because, Yamamoto as modified by Chou and Miyazaki teaches the same composition (an electret having a first polymer copolymerized from VDF as a first monomer and CTFE as a second monomer, and a third monomer such as methyl methacrylate) as claimed by Applicant. Thus, it is not seen that the copolymer of VDF and CTFE as taught by Yamamoto would not have the content of the fluorine element from 60 and 76 wt% as claimed.

12. With respect to claim 50, Yamamoto teaches in case of dissolving method, the copolymer (A) and the vinylidene fluoride base resin are put into a suitable polar solvent such as dimethylformamide (column 4, lines 17-20). Regarding claims 51 and 52, Yamamoto as modified by Chou and Miyazaki teaches claimed invention except the initial surface potential of the electret as claimed in claim 51 and a surface potential of electret as claimed in claim 52. However, it is reasonable to presume that the piezoelectric sheet or film of Yamamoto as modified by Chou and Miyazaki necessarily

has the claimed initial surface potential as claimed in claim 51 and a surface potential as claimed in claim 52 because like material has like property. The electret composite of Applicant comprises a porous substrate and an electret coated on the porous substrate wherein the electret has a first polymer copolymerized from VdF as a first monomer and HFP, CTFE, TFE, or combinations thereof as a second monomer, and a third monomer as listed in claim 39. Further, the electret of Applicant is polarized by corona discharge. The piezoelectric sheet or film of Yamamoto as modified by Chou and Miyazaki as applied to claim 39 also comprises a porous substrate with a piezoelectric sheet wherein the piezoelectric sheet comprises a copolymer of VDF and CTFE, and a third monomer such as butyl vinyl ether. Thus, the initial surface potential as claimed in claim 51 and a surface potential as claimed in claim 52 would have been present. Note that reliance upon inherency is not improper even though rejection is based on Section 103 instead of Section 102. *In re Skoner*, et al. (CCPA) 186 USPQ 80.

13. Claims 48 and 49 are rejected under 35 U.S.C. 103(a) as obvious over Yamamoto et al. (US 4,560,737) in view of Chou et al. (US 2003/0054716A1) and Miyazaki et al. (US 4,931,505) as applied to claim 39 above, and further in view of Allen et al. (US 5,610,455).

14. The invention of Yamamoto as modified by Chou and Miyazaki is previously disclosed. Yamamoto is silent as to teaching the second polymer mixed with the first polymer as claimed in claim 48 and the content of the second polymer in the second



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polymer in the electret is approximately 60 wt% or less. However, Allen discloses an electret comprising syndiotactic vinyl aromatic polymer, for example syndiotactic polystyrene. These electrets have good charge retention at elevated temperature (abstract). Further Allen discloses that preferably the syndiotactic vinyl aromatic polymer comprises at least 30% by weight of the composition based on the total polymers in the blend. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add the syndiotactic polystyrene in the piezoelectric polymeric material of Yamamoto, motivated by the desire to provide electrets having good charge retention at elevated temperature.

#### ***Response to Arguments***

15. Applicant's arguments filed 10/31/07 have been fully considered and they are found persuasive.

#### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANISH DESAI whose telephone number is (571)272-6467. The examiner can normally be reached on Monday-Friday, 8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hai Vo can be reached on 571-272-1485. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. D./

Examiner, Art Unit 1794

/Hai Vo/

Hai Vo

Primary Examiner, Art Unit 1794